

## REMARKS/ARGUMENTS

In the Office Action of April 24, 2009, claims 1-20 are rejected. Additionally, the drawings are objected to. In response, claims 1-8, 11-16, 18 and 19 have been amended. Additionally, claims 9 and 17 have been canceled. Support for the amendments to claims 1-6, 11-14, 16, 18 and 19 is found in Applicants' specification at, for example, original claims 1-20, Fig. 1a and pages 7 and 8. Support for the amendments to claims 7, 8 and 15 is found in Applicants' specification at, for example, original claims 1 and 11 and pages 11 and 12. Applicants hereby request reconsideration of the application in view of the claim amendments and the below-provided remarks.

### Objections to the Drawings

The drawings are objected to as allegedly lacking descriptive labels. However, Applicants respectfully note that the current application is a U.S. National Stage application. The labeling of figures with text matter is prohibited under PCT Rule 11.11, except when absolutely indispensable for understanding. Further, MPEP 1893.03(f) states that "[t]he USPTO may not impose requirements beyond those imposed by the Patent Cooperation Treaty (e.g., PCT Rule 11)." In the present application, Applicants submit that the addition of text labels to the drawings is not "absolutely indispensable" because the individual drawing elements are identified and described in the specification.

Thus, Applicants respectfully assert that additional text labeling is not required in the drawings of the current application. As a result, Applicants respectfully request that the objections to the drawings be withdrawn.

### Claim Rejections under 35 U.S.C. 112, second paragraph

Claim 2-6 and 11-20 are rejected under 35 U.S.C. 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. In response, claims 1-6, 11-14, 16, 18 and 19 have been amended.

In particular, claims 2 and 3 are rejected for being contradictory to claim 1. In response, claims 1-3 have been amended. Specifically, claim 1 has been amended to recite in part:

“identifying if a zero value condition exists within either real component of the next phasor or imaginary component of the next phasor by the oscillator; and if the zero value condition exists, substituting a complementary component of the real component or the imaginary component of the next phasor that exhibits the zero value condition with a complex component that has unity amplitude by the oscillator.” (emphasis added)

Claim 2 has been amended to recite:

“if the zero value condition does not exist, identifying if a condition of equality exists between absolute value of the real component of the next phasor and absolute value of the imaginary component of the next phasor; if the condition of equality exists, substituting both the real and imaginary components of the next phasor with a complex component that has a square-root of one-half unity amplitude.” (emphasis added)

Claim 3 has been amended to recite:

“if the condition of equality does not exist, determining an error factor for the real and imaginary components of the next phasor and correcting the real and imaginary components by removing the error factor.” (emphasis added)

As amended, claims 2 and 3 are not contradictory to amended claim 1.

Claims 4 and 5 are rejected because of the phrase “the step of identifying” is allegedly unclear. In response, claim 4 has been amended to recite:

“the identifying if the zero value condition exists within either the real component of the next phasor or the imaginary component of the next phasor comprises examining a plurality of highest order bits of the next phasor for the zero value condition, and wherein the identifying if the condition of equality exists between the real component of the next phasor and the imaginary component of the next phasor comprises examining a plurality of highest order bits of the next phasor for the condition of equality.” (emphasis added)

Claim 5 has been amended to recite:

“the examining the highest order bits of the next phasor for the zero value condition comprises determining if all the highest bits of the next phasor are either a logical 0 or a logical 1” (emphasis added)

As amended, claims 4 and 5 are clear with respect to “identifying.”

Claim 6 is rejected because of the phrase “the step of substituting” is allegedly unclear. In response, claim 6 has been amended to remove the phrase “the step of

substituting further comprises substituting a components of a square-root of one-half unity amplitude for both real and imaginary components of the next phasor.”

Claim 11 is rejected because of the phrase “substituting at least one component (18, 24) within the next phasor” is allegedly indefinite. In response, claim 11 has been amended to replace the phrase “substituting at least one component (18, 24) within the next phasor” with the phrase “*substituting at least one component (18, 24) within the next phasor with a complex component that has unity amplitude or a complex component that has a square-root of one-half unity amplitude.*”

Claim 12 is rejected because it is allegedly unclear what is examined for the highest order bits. In response, claim 12 has been amended to recite “*the step of identifying is performed by examining logic values of a plurality of highest order bits of the next phasor to determine if the next phasor is integer multiple of 45 degrees*” (emphasis added).

Claim 16 is rejected because of the phrase “implementing successive complex multiplications (14) upon a current phasor” is allegedly misdescriptive. In response, claim 16 has been amended to replace the above-identified phrase with the phrase “*successively multiplying a current phasor by a predetermined value once every sampling interval.*”

Claim 17 is rejected because it is unclear what is examined for the most significant bits. In response, claim 17 has been canceled and claim 18 has been amended to recite “*the step of examining logic values of a plurality of the most significant bit of the next phasors for the cumulative round-off errors*” (emphasis added).

Claim 19 is rejected because the phrase “the step of examining” lacks antecedent basis and “it is unclear as to what ‘a condition of equal absolute-valued components’ is.” In response, claim 19 has been amended to be dependent on claim 18 and to recite in part “*the detecting comprises identifying if absolute value of real component of a next phasor is equal to absolute value of imaginary component of the next phasor.*”

In view of the amendments to claims 1-6, 11-14, 16, 18 and 19, Applicants respectfully request that the rejections to claims 2-6 and 11-20 under 35 U.S.C. 112, second paragraph be withdrawn.

Applicants note that pending claims have been further amended to correct informalities.

#### Claim Rejections under 35 U.S.C. 101

Claims 1-20 are rejected under 35 U.S.C. 101 because the claimed invention is allegedly directed to non-statutory subject matter.

In response, independent claim 1 has been amended to recite:

“A method for generating complex sinusoids of a desired frequency using an oscillator comprising the steps of:  
multiplying a current phasor by a predetermined value (14) once every sampling interval to create a next phasor by the oscillator;  
identifying if a zero value condition exists within either real component of the next phasor or imaginary component of the next phasor by the oscillator; and  
if the zero value condition exists, substituting a complementary component of the real component or the imaginary component of the next phasor that exhibits the zero value condition with a complex component that has unity amplitude by the oscillator.” (emphasis added)

Independent claims 11 and 16 have also been amended in a similar fashion. Support for the amendments to claims 1, 11 and 16 is found in Applicants’ specification at, for example, Fig. 3, the first paragraph of page 1 and pages 4 and 5. Applicants respectfully submit that amended claim 1, 11 and 16 are directed to statutory subject matter because amended claim 1, 11 and 16 recite processes tied to another statutory class, in particular, an oscillator.

Additionally, because amended claim 1, 11 and 16 recite processes tied to an oscillator, Applicants respectfully assert that amended claim 1, 11 and 16 do not cover “every substantial practical application.” Because amended claim 1, 11 and 16 do not cover “every substantial practical application,” Applicants respectfully assert that amended claim 1, 11 and 16 are not directed to “a preemption of a computation.” Because amended claim 1, 11 and 16 are not directed to “a preemption of a computation,” Applicants respectfully assert that amended claim 1, 11 and 16 are directed to statutory subject matter.

Because claims 2-8, 10, 12-15, 18-20 are dependent on claim 1, 11 and 16 respectively, Applicants respectfully assert that claims 2-8, 10, 12-15, 18-20 are directed

to statutory subject matter. Thus, Applicants respectfully request that the rejections to claims 1-20 under 35 U.S.C. 101 be withdrawn.

#### Claim Rejections under 35 U.S.C. 102 and 35 U.S.C. 103

Claims 1, 8, 9, 16 and 17 are rejected under 35 U.S.C. 102(e) as allegedly being anticipated by Napolitano (U.S. Pat. No. 6,981,011). Claims 7, 10 and 20 are rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Napolitano. However, Applicants respectfully submit that the pending claims are neither anticipated by nor obvious over Napolitano for the reasons provided below.

#### Independent Claim 1

As described above, claim 1 has been amended to overcome claim rejections under 35 U.S.C. 112 and under 35 U.S.C. 101.

Applicants respectfully assert that Napolitano fails to disclose all of the limitations of amended claim 1. In particular, Applicants respectfully assert that Napolitano fails to disclose “*identifying if a zero value condition exists within either real component of the next phasor or imaginary component of the next phasor by the oscillator,*” as recited in amended claim 1. Additionally, Applicants respectfully assert that Napolitano fails to disclose “*if the zero value condition exists, substituting a complementary component of the real component or the imaginary component of the next phasor that exhibits the zero value condition with a complex component that has unity amplitude by the oscillator,*” as recited in amended claim 1. Therefore, Applicants respectfully assert that amended claim 1 is not anticipated by Napolitano.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Napolitano discloses that a first phasor and a delta phasor are multiplied to produce a second phasor. (See Fig. 4 and column 5, line 61-column 6, line 44). However, Napolitano fails to disclose identifying whether a zero value condition exists within either real component of the second phasor or imaginary component of the second

phasor. Thus, Applicants respectfully assert that Napolitano fails to disclose “*identifying if a zero value condition exists within either real component of the next phasor or imaginary component of the next phasor by the oscillator,*” as recited in amended claim 1.

Additionally, Napolitano fails to disclose substituting a complementary component of the real component or the imaginary component of the second phasor that exhibits a zero value condition with a complex component that has unity amplitude. Thus, Applicants respectfully assert that Napolitano fails to disclose “*if the zero value condition exists, substituting a complementary component of the real component or the imaginary component of the next phasor that exhibits the zero value condition with a complex component that has unity amplitude by the oscillator,*” as recited in amended claim 1.

Thus, Applicants respectfully assert that Napolitano fails to disclose all of the limitations of amended claim 1. As a result, Applicants respectfully assert that amended claim 1 is not anticipated by Napolitano.

#### Dependent Claims 2-8 and 10

Claims 2-8 and 10 depend from and incorporate all of the limitations of independent claim 1. Thus, Applicants respectfully assert that claims 2-8 and 10 are allowable at least based on an allowable claim 1. Additionally, Applicants respectfully assert that claims 2, 3 and 6-8 may be allowable for further reasons, as described below.

#### Claim 2

Applicants respectfully assert that Napolitano fails to disclose that “*if the zero value condition does not exist, identifying if a condition of equality exists between absolute value of the real component of the next phasor and absolute value of the imaginary component of the next phasor; if the condition of equality exists, substituting both the real and imaginary components of the next phasor with a complex component that has a square-root of one-half unity amplitude,*” as recited in claim 2.

As described above, Napolitano discloses that a first phasor and a delta phasor are multiplied to produce a second phasor. However, Applicants respectfully assert that

Napolitano fails to disclose identifying if a condition of equality exists between absolute value of the real component of the second phasor and absolute value of the imaginary component of the second phasor. Additionally, Applicants respectfully assert that Napolitano fails to disclose substituting both the real and imaginary components of the second phasor with a complex component that has a square-root of one-half unity amplitude. Thus, Applicants respectfully asserts that Napolitano fails to disclose the above-identified limitation of claim 2. As a result, Applicants respectfully assert that claim 2 is not anticipated by Napolitano.

### Claim 3

Applicants respectfully assert that Napolitano fails to disclose that “*if the condition of equality does not exist, determining an error factor for the real and imaginary components of the next phasor and correcting the real and imaginary components by removing the error factor*” (emphasis added), as recited in claim 3.

As described above, Napolitano discloses that a first phasor and a delta phasor are multiplied to produce a second phasor. However, Applicants respectfully assert that Napolitano fails to disclose if a condition of equality between absolute value of real component of the second phasor and absolute value of imaginary component of the second phasor does not exist, determining an error factor for the real and imaginary components of the second phasor. Thus, Applicants respectfully assert that Napolitano fails to disclose the above-identified limitation of claim 3. As a result, Applicants respectfully assert that claim 3 is not anticipated by Napolitano.

### Claim 6

Applicants respectfully assert that Napolitano fails to disclose that “*the identifying if the zero value condition exists within either the real component of the next phasor or the imaginary component of the next phasor comprises identifying whether either the real component of the next phasor is zero or whether the imaginary component of the next phasor is zero, wherein the substituting the complementary component of the real component or the imaginary component of the next phasor that exhibits the zero value condition with the complex component that has unity amplitude comprises: substituting*

*the real component of the next phasor with the complex component that has unity amplitude when the imaginary component of the next phasor is zero; and substituting the imaginary component of the next phasor with the complex component that has unity amplitude when the real component of the next phasor is zero,” as recited in claim 6.*

As described above, Napolitano discloses that a first phasor and a delta phasor are multiplied to produce a second phasor. However, Applicants respectfully assert that Napolitano fails to disclose the above-identified limitation of claim 6. As a result, Applicants respectfully assert that claim 6 is not anticipated by Napolitano.

#### Claims 7 and 8

Applicants respectfully assert that Napolitano fails to disclose that *“the error factor, the real and imaginary components of the next phasor and corrected real and imaginary components satisfy:*

$$x' = x - \varepsilon \times x,$$

$$y' = y - \varepsilon \times y,$$

*where  $\varepsilon$  represents the error factor,  $x$  and  $y$  represent the real and imaginary components of the next phasor, respectively, and  $x'$  and  $y'$  represent the corrected real and imaginary components of the next phasor, respectively,” as recited in claim 7.*

Additionally, Applicants respectfully assert that Napolitano fails to disclose that *“wherein the error factor and the real and imaginary components of the next phasor satisfy:*

$$\varepsilon = \frac{x^2 + y^2 - 1.0}{2},$$
 as recited in claim 8.

As a result, Applicants respectfully assert that claims 7 and 8 are not anticipated by Napolitano.

#### Independent Claim 11

Amend claim 11 includes a similar limitation to claim 2. Because of the similarity between claim 11 and claim 2, Applicants respectfully assert that some remarks provided above with regard to claim 2 apply also to claim 11. Accordingly, Applicants respectfully assert that claim 11 is not anticipated by Napolitano.



#### Dependent Claims 12-15

Claims 12-15 depend from and incorporate all of the limitations of independent claim 11. Thus, Applicants respectfully assert that claims 12-15 are allowable at least based on an allowable claim 11. Additionally, Applicants respectfully assert that claims 12-15 may be allowable because of their individual limitations, respectively.

#### Independent Claim 16

Applicants respectfully assert that Napolitano fails to disclose “*successively multiplying a current phasor by a predetermined value once every sampling interval to create a plurality of next phasors by the oscillator,*” as recited in amended claim 16.

As described above, Napolitano discloses that a first phasor and a delta phasor are multiplied to produce a second phasor. However, Applicants respectfully assert that Napolitano fails to disclose successively multiplying a first phasor by a predetermined value once every sampling interval to create second phasors. Thus, Applicants respectfully assert that claim 16 is not anticipated by Napolitano.

#### Dependent Claims 18-20

Claims 18-20 depend from and incorporate all of the limitations of independent claim 16. Thus, Applicants respectfully assert that claims 18-20 are allowable at least based on an allowable claim 16. Additionally, Applicants respectfully assert that claims 18 and 19 may be allowable because of their individual limitations, respectively.

## **CONCLUSION**

Applicants respectfully request reconsideration of the claims in view of the amendments and remarks made herein. A notice of allowance is earnestly solicited.

Respectfully submitted,

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